

ABSTRACT

An improved centrifugally-cast tube is provided, along with a related method and apparatus of making the tube. The tube includes a plurality of grooves and bosses that are mechanically machined into an interior surface of the tube, such as by a broaching process. The profile of grooves and bosses may be defined by a plurality of intersecting concave and convex radii. The tube is resistant to creep, carburization and metal dusting. The tube also has an enhanced heat transfer rate, and a desirable surface roughness. A method of making the tube is also provided. The method essentially consists of mechanically deforming the interior surface of the tube by passing a series of cutting inserts on support rings having incrementally-differing dimensions over the interior surface. An apparatus is also provided which includes a telescoping shaft upon which is mounted at least one cutting tool that has a plurality of cutting inserts and is adapted to form a plurality of grooves and bosses in the interior surface of the tube. The grooves and bosses may be straight or spiraled.

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